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Primary care providers' attitudes and knowledge of bariatric surgery

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Abstract

Background Despite the increasing obesity prevalence among American adults, relatively few qualified patients proceed to bariatric surgery. Suggested explanations include referral barriers for weight loss management at primary care provider (PCP) visits. This study aims to assess the referral and practice patterns of PCPs treating patients with obesity. Our goal is to understand treatment barriers in order to implement targeted interventions that enhance quality of care.

Methods A 39-question electronic survey was emailed to PCPs at a single academic institution with community physicians. Questions explored providers' demographics, referral patterns, and knowledge of pathophysiologic obesity mechanisms and bariatric surgery qualifications. Frequency and univariate analyses were performed and compared providers' demographics, positions, and BMIs between referring providers and non-referring providers.

Results Of 121 surveys distributed, we achieved a 33.9% response rate ($n=41$). 78.0% stated that > 15% of their patients in the preceding year were classified as obese. PCPs indicated initiating weight loss management conversations < 50% of the time with 48.8% of patients. Provider-identified barriers to discussing weight loss surgery included being unsure if patient's insurance would cover the procedure or if patients would qualify (24.4% vs. 19.5%). In addition, 43.9% of providers felt that the risks of bariatric surgery outweigh the benefits.

Conclusion Despite a large percentage of patients cared for by PCPs being classified as obese, few providers initiate discussions on weight loss options with potentially eligible surgical candidates. The barriers identified indicate an opportunity for improved education on patient qualifications, strategies for streamlining conversations and referrals, and reinforcement of the safety of surgical weight loss. Providers' desire for this education demonstrates an opportunity to work toward minimizing the referral gap by increasing patient conversations about these topics.

Keywords Bariatric surgery · Referral patterns · Primary care providers

Abbreviations

PCP	Primary care provider
LSG	Laparoscopic sleeve gastrectomy
RYGB	Roux-en-Y gastric bypass
BMI	Body mass index
APP	Advanced practice provider

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The prevalence of obesity among the United States adults continues to be a matter of serious concern, affecting 33% of the population [1]. Models suggest that the prevalence could be as high as 51% by the year 2030 [2]. Not only do obesity and its comorbidities place significant burden on the individual, impacting health and quality of life, but they have significant financial ramifications on the global healthcare system. Long-term health consequences of obesity are vast-ranging from liver disease to obstructive sleep apnea to type 2 diabetes to cardiovascular disease [3]. However, the effects of this epidemic are not confined to an individual scale. Data from 2014 indicate that the national economic burden of obesity amounted to 2.8% of the gross domestic product—an estimated $2.0 trillion dollars [4].

In light of this significant healthcare issue, the American Society for Metabolic and Bariatric Surgery released a consensus statement in 2005 stating that "bariatric surgery is the most effective therapy available for morbid obesity

[5]." Bariatric surgery is effective in comorbidities resolution as well as lowering all-cause mortality [6, 7]. Despite these recommendations and favorable outcomes on patient health, < 1% of the US adults classified as severely obese proceed to bariatric surgery annually [8].

Suggested explanations for the disparity between potentially eligible patients and the number of bariatric surgeries performed include the existence of referral barriers at primary care providers' (PCP) offices. Previous studies have begun to explore factors such as providers' referral strategies, providers' bias and beliefs regarding obesity, and the influence of providers' obesity management training on referrals [8–12]. In spite of this work to understand the cause behind the referral gap, the disparity remains. This study aims to assess the referral and practice patterns of PCPs treating patients with obesity at an academic institution with community physicians. Our goal is to understand provider-identified treatment barriers in order to implement targeted interventions that enhance the quality of care for patients with obesity.

Materials and methods

A 39-question electronic survey was designed using Qualtrics Survey Software (Provo, Utah). Questions explored providers' demographics, referral patterns for weight loss management, knowledge of pathophysiologic mechanisms of obesity, and bariatric surgery qualifications. The survey was collected anonymously; however, providers were given the option to provide their name, position, and contact information to receive post-survey educational materials, as well as the ability to leave comments regarding their treatment of patients with obesity. The survey was distributed via email to PCPs at a single academic institution with community physicians. PCPs included internal medicine physicians, family medicine physicians, and advanced practice providers (APP). A reminder email was sent approximately 3 weeks after the initial email communication to encourage participation.

Data were analyzed according to providers' gender, age, position, and BMI. Age categories were divided into PCPs with ages in the range of 25–44 and those with ages in the range of 45–64. Referring providers were defined as those who had referred at least one patient to a bariatric surgeon in the past 12 months. Provider positions were analyzed according to three categories: internal medicine physician, primary care physician, and advanced practice provider. Body mass index (BMI) classes were established according to the American Society for Metabolic and Bariatric Surgery's criteria [13]. Provider BMI was calculated based on provided height and weight. BMI was divided into two groups for analysis: those with a BMI of < 25 kg/m^2 and those characterized as overweight or obese with a BMI of ≥ 25 kg/m^2. The Medical College of Wisconsin Institutional Review Board (Milwaukee, Wisconsin) approved this study.

Statistical analysis: SPSS, version 24 (IBM corp., Armonk, NY, USA) was used for statistical analysis. Categorical data were analyzed using ANOVA and χ^2 tests and presented as the number of subjects (n) and percentage of total data (%). Continuous values were analyzed using independent samples t tests for parametric data and Mann–Whitney U test for nonparametric data, as well as the F test. Continuous data were reported as the mean ± standard deviation. Univariate analyses were used to compare providers' demographics, position, specialty, and BMI between referring providers and non-referring providers. Analysis of continuous values by providers' specialty utilized the F test and was adjusted for multiple testing using the Holm's procedure. For all analyses, a p value of < 0.05 was considered statistically significant.

Results

Of 121 surveys distributed to providers, 41 responded (33.9%). The majority of respondents were female ($n = 24$, 58.5%) and between the ages of 35 and 44 ($n = 14$; 34.1%). 21(51.2%) self-identified as primary care physicians, 16 (39.0%) as internal medicine providers, and 4 (9.8%) as APPs. 11 respondents had a BMI considered overweight (26.8%), while 4 (9.8%) had a BMI classified as obese. Male providers had a significantly greater BMI (26.3 ± 4.0) compared to females (23.4 ± 2.4, $p = 0.01$) (Table 1). 75.6% ($n = 31$) of providers were characterized as referring providers (Table 2).

When asked about patient weights, 90.2% of providers indicated that > 15% of the patients they had seen in the past 12 months were overweight, 78.0% indicated that > 15% of their patients were obese, and 14.6% reported that > 15% of their patients had a BMI indicating morbid obesity (Table 3). When analyzed by age, 100.0% of older providers aged 45–64 stated > 15% of their patient population was overweight which is significantly more than younger providers aged 25–44 years (100% versus 80%, $p = 0.03$). When analyzed by providers' gender, BMI, or providers' position, there was no significant difference in the percentage of patients seen in the past 12 months with an overweight BMI.

Questions also explored conversation patterns between providers and their patients. 51.2% of providers indicated that they initiated discussions regarding weight loss management greater than 50% of the time. Male providers were significantly more likely to initiate these conversations > 50% of the time when compared to female providers (76.5% vs. 37.5%, $p = 0.01$). There was no significant difference when

Table 1 Providers' demographics

Gender	
Female	24 (58.5%)
Male	17 (41.5%)
Age	
25–34	6 (14.6%)
35–44	14 (34.1%)
45–54	11 (26.8%)
55–64	10 (24.4%)
BMI (kg/m^2)	
18.5–24.99	26 (63.4%)
25–29.99	11 (26.88%)
30–39.99	4 (9.8%)
Average BMI by gender	
Female	23.4 ± 2.4
Male	26.3 ± 4.0
Specialty	
Primary care physician	21 (51.2%)
Internal medicine physician	16 (39.0%)
Advanced practice provider	4 (9.8%)

Table 2 Primary care providers' referral patterns

Referred 1+ patient to a surgeon in past 12 months	
Yes	31 (75.6%)
No	10 (24.4%)
Likeliness to recommend exercise programs to patients	
Frequently/almost always	36 (87.8%)
Sometimes	2 (4.9%)
Infrequently/almost never	3 (7.3%)
Likeliness to recommend medications to for weight loss	
Frequently/almost always	12 (29.3%)
Sometimes	15 (36.6%)
Infrequently/almost never	14 (34.1%)
If you feel a patient meets criteria, how often do you refer?	
Always	4 (9.8%)
Often	13 (31.7%)
Sometimes	12 (29.3%)
Rarely	11 (26.8%)
Never	1 (2.4%)

comparing the number of providers initiating conversations at this frequency when analyzed by BMI, age, referring practitioner, or providers' specialty.

In addition, referring providers were significantly more likely to indicate they feel comfortable broaching the topic of weight loss surgery when compared to non-referring providers (96.9% vs. 70.0%, $p = 0.01$). The top three reasons indicated by all providers for being uncomfortable broaching weight loss surgery discussions included being

Table 3 Patient panel demographics

Percentage of patients overweight	
> 15%	37 (90.2%)
11–15%	4 (9.8%)
Percentage of patients obese	
> 15%	32 (78.0%)
11–15%	7 (17.1%)
6–10.99%	2 (4.9%)
Percentage of patients morbidly obese	
> 15%	6 (14.6%)
11–15%	12 (29.3%)
6–10.99%	15 (36.6%)
< 6%	8 (19.5%)

Table 4 Reasons for provider's discomfort in weight loss surgery conversations

Why are you uncomfortable broaching the topic of weight loss surgery with your patients?	
Unsure if the patient's insurance would cover	10 (24.4%)
Unsure if the patient would qualify	8 (19.5%)
Insufficient knowledge to educate the patient on options	7 (17.1%)
Surgery is too invasive or high risk	5 (12.2%)
Fear of losing rapport with the patient	3 (7.3%
I *am comfortable* broaching the topic of weight loss surgery with my patients	24 (58.5%)

unsure if insurance would cover the procedure, being unsure if the patient would qualify for surgery, and insufficient knowledge to educate patients on options (24.4% vs. 19.5% vs. 17.1%) (Table 4). Of note, 29.3% of providers stated that even if they felt a patient meets weight loss surgery criteria, they rarely or never refer that patient for bariatric surgery (Table 2). Obstacles indicated in referring patients for metabolic and bariatric surgery included lack of patient interest, time restrictions during patient visits, and prior experiences of poor patient outcomes after surgery (61.0% vs. 14.6% vs. 12.2%) (Table 5).

Providers were also asked if they felt confident managing complications patients may face following bariatric surgery. Over half of them (56.1%) indicated that they felt somewhat or very uncomfortable addressing complications from bariatric surgery (Table 6). Older providers were significantly more likely to describe themselves as confident in addressing complications than their younger counterparts (71.4% vs. 15.0%, $p < 0.0001$). In addition, 43.9% felt that the risks of bariatric surgery outweigh the benefits. Despite this, only 53.7% correctly identified the mortality of Roux-en-Y gastric bypass as 0.1% (Table 6).

Table 5 Provider-indicated obstacles to bariatric surgery referral

What do you feel is the biggest obstacle to referring patients for metabolic and bariatric surgery?	
Lack of patient interest or engagement in obesity management	25 (61.0%)
Time restriction during patient visits	6 (14.6%)
Prior experiences of poor patient outcomes after metabolic and bariatric surgery	5 (12.2%)
Poor reimbursement for services	2 (4.9%)
Unclear how to refer patients (i.e., how to place the order, who will contact the patient)	1 (2.4%)
Insufficient feedback following referral	1 (2.4%)
Fear of complications or mortality	1 (2.4%)

Table 6 Provider knowledge and confidence

How confident do you feel addressing complications after bariatric surgery?	
Very confident	2 (4.9%)
Somewhat confident	16 (39.0%)
Somewhat unconfident	18 (43.9%)
Very unconfident	5 (12.2%)
What is the correct mortality rate of Roux-en-Y?	
0.1% (correct response)	22 (53.7%)
1%	17 (41.5%)
2–4%	2 (4.9%)
Do you feel the risks of bariatric surgery outweigh the benefits?	
Yes	18 (43.9%)
No	23 (56.1%)

Survey questions also examined PCP's referral patterns. Exercise was indicated as a form of weight loss management, which was frequently or almost always recommended by 87.8% (Table 2). In addition, referring providers were significantly more likely to recommend exercise programs compared to non-referring providers (96.8% vs. 60.0%, $p=0.002$). When asked about recommending medications as a weight loss tool, only 29.3% indicated that they frequently or almost always use this method (Table 2). Despite this, providers with a BMI ≥ 25 kg/m^2 were significantly more likely to recommend this treatment than providers with a BMI < 25 kg/m^2 (53.3% vs. 15.4%, $p=0.01$).

Discussion

The results of this study indicate several referral barriers that could be contributing to the disparity between potentially eligible bariatric surgery patients and the number of bariatric surgeries performed. This includes the frequency with which PCPs initiated weight loss discussions with patients suffering from obesity. In particular, this study found that only 51.2% of providers reported initiating discussions regarding weight loss management > 50% of the time, meaning that often, patients are responsible for starting these conversations or these topics are not discussed at all. Previous investigation into this topic has demonstrated conflicting results. One study reported 72% of PCPs had discussions regarding weight with patients with obesity less than half of the time, while another reported 76.5% of providers "frequently" discuss weight loss with their patients [14, 15]. However, an additional investigation looking at PCP referral for bariatric surgery in Denmark found that only 13% indicated they would, on their own initiative, discuss bariatric surgery [3]. Explanations for these variances could include differing providers' perceptions as to the actual number of conversations that occurred, as well as varying PCP treatment strategies of their patients. A study by Funk et al. investigated provider-identified approaches for the treatment of patients with severe obesity and found varying approaches, including letting the patient choose which comorbidity they would like to discuss, first addressing the disease the PCP identified as "most dangerous," as well as treating the disease which was the easiest to address [8]. Adopting one of these treatment strategies, and focusing on the comorbidities of obesity, or another health issue altogether, could explain the high number of PCPs not initiating direct conversations regarding weight loss management in our study.

Interestingly, this study did find that male providers were significantly more likely to initiate weight loss conversations > 50% of the time when compared to female providers, a difference that was not observed when providers were compared by BMI, age, referring practitioner, or their position. This differs from a previous Danish study investigating the prevalence of diet and exercise consultations in which female general practitioners were more likely than their male counterparts to focus on counseling patients who were overweight [3]. However, this result is not consistent with a different study which concluded that physician gender did not influence the frequency of these conversations [16]. It is clear, however, that these discussions are a vital step in the process to work toward minimizing the referrals gap.

One potential reason for not initiating conversations especially around weight loss surgery could be attributed to the comfort level of providers. Results of this study demonstrated providers who had referred a patient in the past

12 months for bariatric surgery were significantly more likely to indicate that they felt comfortable broaching this topic with patients than those who had not referred a patient. The top three reasons providers indicated for this discomfort included being unsure if insurance would cover the procedure, being unsure if the patient would qualify for surgery, and insufficient knowledge to educate patients on options. These results echo those of previous studies which indicated lack of or insufficient insurance coverage and high costs as some of the biggest barriers preventing bariatric surgery referrals [8, 17, 18].

Additional reasons for the referral gap could be attributed to providers' perceptions on the risks of bariatric surgery. This study found that 43.9% felt that the risks of bariatric surgery outweighed the benefits, while 29.3% stated that even if a patient met weight loss criteria, they rarely or never refer that patient to bariatric surgery. These results are very much in line with those of previous studies. In one study of PCPs at an integrated health network, only 55.9% felt that bariatric surgery was a safe method for weight loss [15]. Additional studies indicated providers' hesitance to refer to bariatric surgery could be attributed to such things as previous negative experiences and fear of postoperative complications [3, 8, 19]. Results of providers' knowledge from our study indicate this perception may be due to a lack of knowledge regarding the safety of bariatric surgery. Only 53.7% of providers correctly identified the mortality of Roux-en-Y gastric bypass as 0.1%, with the rest incorrectly choosing mortality values 10–40 times higher than the actual value [20]. Further education is necessary not only to provide PCPs with current and accurate information on how bariatric surgery safety has changed since its inception and why the health benefits of bariatric surgery, in many cases, do outweigh possible risks.

In regards to the preferred weight loss management strategies of PCPs, our study concluded that 87.8% of providers indicated they frequently or almost always recommended exercise. This is in line with a previous study investigating obesity management at an integrated health network which noted 55.6% of PCPs recommended exercise "frequently," with 33.3% "always" recommending this treatment [15]. In addition, this study found that while only 29.3% of PCPs indicated frequently or almost always using medications as a weight loss tool, providers with a BMI $\geq$ 25 kg/m^2 were significantly more likely to recommend this than providers with a lower BMI. This agrees with previous studies looking at the impact of providers' BMI in weight loss management, which have found that physicians with an overweight or obese BMI had "greater confidence" prescribing medications than those who have a lower BMI [14, 21].

While this study adds valuable knowledge regarding the potential impact of PCPs' attitudes and knowledge regarding bariatric surgery on referrals, there are some notable limitations. The relatively small sample size ($n = 41$) does limit the generalizability of the results and also could contribute to a significant sample error. Although we are limited by the number of participants, we feel that the insight into primary care physicians' challenges and perceived barriers in the care of obese patients is valuable. The limited response from APPs, in particular, may limit the applicability of these results to those providers. In addition, the survey, though based on extensive research of literature and survey design and tested on numerous peers in the field, was not validated. It is also important to acknowledge that survey responses are based solely on the perspective of the providers themselves as well as their ability to recall patient interactions. Future studies on larger cohorts of PCPs with a standardized survey will continue to help build the collective knowledge base and contribute toward efforts to decrease the referral gap that is presently seen.

Results from this survey of primary care physicians' attitudes and referral patterns are helpful in identifying gaps in providers' knowledge that may be targeted for intervention. Educational opportunities or resources aimed specifically as the barriers identified may help to improve upon the disparity between potentially eligible patients and those that are ultimately referred for surgical weight loss strategies.

Conclusion

This study contributes additional knowledge to the growing foundation working to understand the referral disparity between potentially eligible bariatric surgery candidates and the number of patients operated on annually. In line with national obesity trends, a large percentage of patients cared for by PCPs are overweight or obese. Despite this, few providers report initiating discussions about weight loss with potentially eligible surgical candidates. Survey results also demonstrate the existence of misconceptions regarding the safety of surgical weight loss. This evidence supports the use of targeted providers' education on patient qualifications, strategies for streamlining conversations and referrals, and the reinforcement of surgical weight loss.

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Compliance with ethical standards

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